

ORIGINAL

before the  
FEDERAL COMMUNICATIONS COMMISSION  
Washington, D.C.

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In the matter of

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An Inquiry into the Commission's )  
Policies and Rules Regarding AM )  
Radio Service Directional Ant- )  
enna Performances )

MM Docket No. 93-177

RM-7594

REPLY COMMENTS OF ROBERT A. JONES, P.E.

I hereby submit the following comments in the above FCC Docket in reply to those parties filing direct comments. I have been a Consulting Engineer since 1955 and have worked in this field since 1950.

In general I applaud the FCC and the various comentors and I support an improvement in the performance of Directional Antenna Systems. But I find there must continue to be monitoring "in the field" to assure proper operation. The total dependancy upon "in house" devices is just not satisfactory. In house meters and or Computers can not guarantee 100% compliance.

Over the past 40 years I have worked on hundreds of DA's from simple two-towers to as many as twelve towers. As a begining point, a good design with well installed equipment and then carefully measured will perform satisfactorily for many years. My experience over the past ten years since the demise of the FIRST CLASS Operator license shows a gradual drop in qualified people to service and to operate DA's. This has led to an increase in the cost to hire those who remain which leads to the false conclusion that "Directionals" are to expensive. They need not be.

In the comments filed by du Treil, Lundin & Rackley, they have reconstructed quite correctly the past history of the metering

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and monitoring of directional antennas in this country. They skipped the fact that at one time we had Phase Monitors which could read only Phase, not its polarity. I well recall some DA's that were tuned up backwards! The polarity is very important. Also I wish to point out that there has been a great advancement in the design and ease of operation of Field Intensity Meters. I started with an old Federal 101-C Meter. It took one man, two boys and a six-volt car battery to operate. The RCA WX series meters were the first truly "portable" ones. The ease of the taking of readings and the good reliability obtained from the current Solid-State Meters is a 100% improvement.

I take exception with those commentators who argue that Computer Modeling is the only approach needed to control any Directional Pattern. I do not deny there have been gains in knowledge in the field of DA's since Doctor Brown's papers in the mid thirties were composed. The fault with Computer Modeling is it can not account for changes in the near-field, in the far field, nor for all other variables. All Engineers agree the coverage and the potential for interference from all Directional Antenna Systems is effected by Weather, By Moisture, By Reflections off nearby objects, By re-radiations, and by other factors common to the Real World. The changing urban environment around any DA Site is in a State of Flux. A computer generated set of conditions taken in 1993 will not be valid for ever afterwards!

I respond to the following Specific Rule Changes:

- 73.14 Critical Arrays should be retained, but relaxed as to the operating limits per tower.
- 73.44 No changes needed
- 73.45 No changes needed

73.51 Stations with Negative towers should be permitted to use any method they find useful in tuning and in controlling said negative tower so long as it results in a stable system.

73.53 No changes needed

~~73.54~~ 73.54 No changes needed

73.58 Delete the Requirement to measure and to record Base Currents and their ratios is an acceptable Monitor System has been approved.

73.61 No changes needed

73.62 Parameter tollerances should be on a Case-by-Case Basis and a tower by tower basis

73.68 No changes needed. Base sampling, even with Computer Designs is highly susseptable to environmental effects if loops are not used in towers greater than 135°

Reference to Critical Arrays should be retained.

Partial Proofs should be used only at Monitor Point Bearings whenever a shift occurs in a tower or in a parameter. No longer should Major lobes and minor lobes be required to be measured.

Specific information on the acceptabliity of Antenna Monitor-SampliyngSystems should be in the Rules and should be uniform for all DA's

73.151 Proofs of Performance should only include:

- 1) Monment Method or other Computer Methods use by the design engineer to predict array parameters.
- 2) A complete description of the monitoring sysstem and the sampling system

- 3) Field Calibration of the Antenna Monitor
- 4) Determination of operating Power, etc.
- 5) Limit DA Proofs to the following Measurements:
  - a) Measurements be taken only at monitor point bearings
  - b) A total of ten points per radial taken between one and sixteen km be made, both DA and ND and ratioed
  - c) Field monitor points be established on each radial and readings be taken monthly.

73.154 Delete request for "full" proofs of performance, retain only requirements for partial proofs of performance as per 73.151 above.

73.189 Delete requirements for minimum tower heights and for minimum radiation efficiency

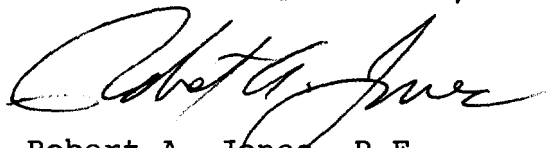
I disagree with those commentators who say the making of Directional Measurements and the simplifying of Proofs will cause the "less-than-honest" behavior to disappear. My experience has been over the past 40 years that those who want to cheat will cheat no matter how simple or how complex the Rules might be.

I disagree with those parties who claim Interference Protection will be no worse with the use of "Moment Methods" than now exists. To ignore reflections, re-radiations, and soil conductivity changes is to behave like an Ostrich Bird.

In conclusion I concur with those parties comments to the extend I have stated above. In general lets simplify Directional Proofs and Field Measurements, but lets not throw them out entirely. I recommend we take only ten points per radial (DA & ND) and measure only critical bearings set forth by the FCC staff. And lets tighten up the sampling system requirements.

Robert A. Jones  
page 5

RESPECTFULLY SUBMITTED,

A handwritten signature in cursive script, appearing to read "Robert A. Jones".

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December 3, 1993